

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT

SCHENECTADY, N. Y. 12305

Phone: (518) 385-4085

DIAL COMM 8*235-4085

MATERIALS
SERVICES
INFORMATION

No. 310

METHYLENE CHLORIDE

REVISION C

Date September 1978

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: METHYLENE CHLORIDE

OTHER DESIGNATIONS: Dichloromethane, Methane Dichloride, CH₂Cl₂, GE Material D5B89, ASTM D3506, CAS# 000 075 092

MANUFACTURER: Available from many suppliers, including Dow Chemical Co. and Diamond Shamrock Corp., Electrochemicals

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Methylene Chloride	Ca 100	8-hr TWA 100 ppm* Human, inhalation TCLo 500 ppm/8-hr (blood effects) Rat, oral LD ₅₀ 2136 mg/kg
*ACGIH (1978) Intended changes list has dropped TLV from 200 ppm to 100 ppm. Current OSHA TLV remains at 500 ppm. NIOSH has proposed a 75 ppm 10 hr-TWA with a ceiling concentration of 500 ppm. (15 minute sampling period) NIOSH also warns that toxic hazards with CH ₂ Cl ₂ are increased by the presence of alcohol and/or carbon monoxide and by heavy labor and smoking.		

SECTION III. PHYSICAL DATA

Boiling point, 1 atm deg F (C) -----	104 (40)	Specific gravity, 25/25C ---	1.32
Vapor pressure at 20 C, mm Hg -----	340	Volatiles, % -----	ca 100
Vapor density (Air=1) -----	2.9	Evaporation rate (CCl ₄ =1) --	1.47
Water solubility, wt. % at 20 C ----	1.6	Solidifies, deg C -----	-95

Appearance & Odor: Colorless liquid; ether-like, sweetish odor. The recognition threshold (unfatigued) is 214 ppm, 100% of test panel.

SECTION IV. FIRE AND EXPLOSION DATA

			LOWER	UPPER
Flash Point and Method	Autoignition Temp.	Flammability Limits In Air		
None	>1033 F	Vol. % at >100 C	12	—

This material does not give a flash or fire point by the conventional test methods. It does form weakly combustible mixtures at high temperatures and high concentrations in air; and it can burn or explode in oxygen enriched air. Firefighters should use self-contained breathing apparatus (with eye protection) for protection from suffocating and intoxicating vapors and from high temperature decomposition products.

SECTION V. REACTIVITY DATA

Methylene chloride is a stable compound under normal conditions of storage and use; however, exposure to high temperatures (open flames, welding arcs, etc.) can give corrosive and toxic thermal-oxidative decomposition products such as hydrogen chloride and phosphene. It does not undergo hazardous polymerization. Prolonged exposure to excess water may cause noticeable hydrolysis above 60 C. Prevent contact with alkali metals and finely powdered aluminum and magnesium to avoid possible violent reactions.

339521



SECTION VI. HEALTH HAZARD INFORMATIONTLV 100 ppm (360 mg/m³) (See Sect II)

ACGIH TLV for methylene chloride lowered from 200 ppm (1977); NIOSH has proposed a 10-hr TWA of 75 ppm. Present OSHA value of 500 ppm will probably be lowered. Inhalation of high concentrations causes loss of coordination and equilibrium, and, if exposure is prolonged excessively, unconsciousness and even death. Prolonged skin contact can be irritating; absorbed through the skin. Eye contact is painful and irritating, but it is not believed likely to produce serious injury. Methylene chloride metabolizes to produce carbon monoxide in the body; it increases and sustains carboxyhemoglobin levels in the blood, reducing the oxygen-carrying capacity of the blood.

FIRST AID:

Eye and Skin contact: Flush contact area with plenty of running water. If irritation persists get medical attention.

Inhalation: Remove to fresh air; give artificial respiration, if required. Keep quiet and warm. Get medical attention; advise physician not to use adrenalin.

Ingestion: Get prompt medical attention. (If physician unavailable, give water or milk and induce vomiting.) Advise physician not to use adrenalin.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

For small spills, soak up with an absorbent solid, such as vermiculite, avoiding breathing of vapors and using gloves to avoid contact. Evaporate off solvent in an exhaust hood or bury with absorbent in a landfill.

When large spills occur, evacuate area; notify safety personnel; provide ventilation. Use protective equipment during clean-up, such as self-contained breathing apparatus, boots, gloves, etc. Contain and recover liquid when possible. Pick up residue with absorbent (as with small spills) or flush to ground (not to sewer) to evaporate.

Reclaim waste solvent by filtration and distillation procedures or dispose of via a licensed, waste solvent disposal company.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Use general ventilation and efficient exhaust ventilation to meet TLV requirements. Air supplied or self-contained breathing apparatus should be available for emergency use. A full facepiece is required above 750 ppm.

Use neoprene or Viton gloves for skin protection and safety glasses. Chemical goggles or a face shield should be used where splashing is possible. An eye wash station should be readily available if splashing is probable.

NOTE: NIOSH indicates that carbon monoxide content and CH₂Cl₂ content of workplace air are additive and that both must be monitored where methylene chloride exposures occur. The 10-hr TWA for CO must not exceed about 9 ppm where exposure to methylene chloride occurs unless CH₂Cl₂ exposure is also controlled to a lower level than the TLV.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Use caution in handling this material. Avoid airborne concentration build-up. Avoid exposure to high temperature. No smoking where vapors of this material are present. Store in a cool, well-ventilated area away from sources of heat. Open containers with caution.

When methylene chloride vapors are drawn into the combustion chamber of a space heater, severe corrosion damage to the heater can occur, even at levels well below TLV.

Those with a history of cardiovascular disease or who are heavy drinkers or smokers should avoid exposure to methylene chloride.

DATA SOURCE(S) CODE: 1-7, 9, 12, 14, 19, 21

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APPROVALS: MIS, CRD

Industrial Hygiene and Safety

Corporate Medical Staff

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT
120 ERIE BOULEVARD
SCHENECTADY, N.Y. 12305



NO. 311

INHIBITED
1,1,1-TRICHLOROETHANE
REVISION D
DATE August 1983

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: INHIBITED 1,1,1-TRICHLOROETHANE
OTHER DESIGNATIONS: Methyl Chloroform, MC, CCl_3CH_3 , GE Material D5B79, CAS# 000 071 556,
 α -Trichloroethane
TRADE NAMES & BLACO-THANE (Baron-Blakeslee), CHLOROTHENE NU & VG (Dow), INHIBISOL
MANUFACTURER: (Penetone Corp.), TRI-ETHANE (PPG Ind. Inc), TRITHENE (SRS, Inc.)

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
1,1,1-Trichloroethane Inhibitor, typical*	>95 < 5	8-hr TWA 350 ppm** Unknown <u>Human, Inhalation</u> LCLo 27 gm/m ³ , 10 min TCLo 920 ppm/70 min (CNS effects) <u>Human, Oral</u> TDLo 670 mg/kg (GI effects)
*Inhibitors used are proprietary. Commercial materials contain up to about 5% inhibitor and are designed for cold cleaning or vapor degreasing use or both.		
**Current OSHA PEL and ACGIH (1983) TLV. ACGIH STEL 450 ppm.		
NIOSH (1976) proposed a 10-hr TWA of 200 ppm with a 350 ppm ceiling (15 minute sample) and has recommended caution in use		

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg F ----- ca 165*	Specific gravity, 25/25C --- 1.3-1.336*
Vapor pressure, 20 C, mm Hg ----- 100	Volatiles, % ----- ca 100
Vapor density (Air=1) ----- 4.55	Melting point, deg C ----- -32
Water solubility, g/100ml H ₂ O @20C - 0.09	Evaporation rate (CCl ₄ =1) -- 1
	Molecular weight ----- 133.41

Appearance & Odor: Colorless liquid with a mild, sweetish, pleasant, ether-like odor which may be just perceptible (unfatigued) at about 100 ppm in air.
*Properties depend on the inhibitor and inhibitor level.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits in Air (High energy ignition source at 25C). Vol. %	Lower	Upper
			8.0%	10.5%
None	537 C (998 F)			

This material is nearly nonflammable. High energy, such as electric arc, is needed for ignition, and the flame tends to go out when the ignition source is removed. Material involved in a fire can emit toxic and irritating fumes. Water fog, carbon dioxide, dry chemical, or foam may be used to fight fires.

Use self-contained or air-supplied breathing apparatus for protection against suffocating vapors and toxic and corrosive decomposition products.

SECTION V. REACTIVITY DATA

This material can be hydrolyzed by water to form hydrochloric acid and acetic acid. It will react with strong caustic, such as caustic soda or caustic potash to form flammable or explosive material. Attacks natural rubber.

It requires inhibitor content to prevent corrosion of metals; and when inhibitor is depleted, it can decompose rapidly by reaction with finely divided white metals, such as aluminum, magnesium, zinc, etc. Do not use these metals for storage containers or in pressurized spraying equipment where MC is involved.

It will decompose at high temperature upon contact with hot metal, or under ultra-violet radiation to produce toxic and corrosive gases (hydrogen chloride, dichloroacetylene, chlorine and some phosgene).

SECTION VI. HEALTH HAZARD INFORMATION		TLV 350 ppm or 1900 mg/m ³
<p>Brief exposure at 900-1000 ppm causes mild eye irritation and loss of coordination due to the early effects of MC on the CNS. Excessive exposure gives headache, drowsiness, impaired judgement, unconsciousness. Defats skin on contact, can produce irritation and dermatitis; can be absorbed through the skin. Eye contact gives pain and irritation. Considered low in toxicity among the chlorinated hydrocarbons.</p> <p>FIRST AID:</p> <p>Eye contact: Flush eyes well with plenty of running water for 15 min, including under eyelids.</p> <p>Skin contact: Remove solvent-wet clothing promptly. Wash contact area with warm water and soap. Get medical attention for irritation.</p> <p>Inhalation: Remove to fresh air. Restore and/or support breathing as needed. Get medical assistance. (Note: Advise physician not to use adrenalin.)</p> <p>Ingestion: Contact physician. Aspiration a hazard! Possible spontaneous vomiting. (If medical help not readily available and amount swallowed was appreciable, give milk or water to drink and induce vomiting. Repeat. Estimated lethal dose for 150 lb man is 0.5 to 1 pint.)</p> <p>PHYSICIAN: Avoid using sympathomimetic amines in treatment.</p>		
SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES		
<p>For small spills in ventilated area, mop, wipe or soak up with absorbent material avoiding inhalation and contact. Evaporate outdoors or in an exhaust hood.</p> <p>For large spills, inform safety personnel and evacuate area. Use protective equipment during clean-up (see Sect. VIII). Ventilate area. Contain liquid, pick up and place in closed metal containers. Do not allow to enter drains and water ways.</p> <p>DISPOSAL: Dispose of via a licensed waste solvent disposal company, or reclaim by filtration and distillation procedures. Follow Federal, State and Local regulations.</p> <p>Aquatic toxicity TLM 96: 100-10 ppm.</p> <p>EPA hazardous waste number under RCRA is U226 (40CFR261).</p>		
SECTION VIII. SPECIAL PROTECTION INFORMATION		
<p>Provide general and local exhaust ventilation to meet TLV requirements. Air-supplied or self-contained respirator should be available for non-routine or emergency use. A chemical cartridge-type respirator can be used for a limited time below 1000 ppm. A full facepiece is needed above 500 ppm.</p> <p>Chemical goggles or a face shield should be worn if splashing is possible. Gloves and apron (of neoprene, polyethylene or polyvinyl alcohol) should be worn when needed to avoid skin contact. Remove solvent-wet clothing promptly. A safety shower and eyewash station should be available to use area if splashing is probable.</p> <p>Preplacement and periodic medical examinations should consider cardiovascular, liver, CNS functions, and skin.</p>		
SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS		
<p>Store in closed containers in a cool, well-ventilated area. Keep water-free. Monitor inhibitor level for vapor degreasing use. Use caution in cleaning operations involving white metal fines (see Sect. V). Trichloroethylene contamination may cause decomposition when aluminum is degreased.</p> <p>Provide medical monitoring of those regularly exposed to MC in the workplace. Preclude those with CNS, liver, or heart disease from exposure. Personnel using this solvent should avoid drinking alcoholic beverages shortly before, during, or soon after exposure. NIOSH (1976 Crit. Doc.) expressed concern because of possible birth defects from high level pregnant rat exposures. Since 1976, directed studies have been negative. At occupational physicians' seminar on "Reproductive Hazards in the Workplace," Washington, DC (4/25/83), no physician was aware of data to substantiate the NIOSH concern.</p> <p>DOT Classification: ORM-A I.D. No. UN2831</p> <p>DATA SOURCE(S) CODE: 1-12, 14, 20, 23, 25, 26, 30, 31, 34, 37, 38, 45-49, 53</p>		
<p>Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.</p>		<p>APPROVALS: MIS/CRD <i>J. M. Nelson</i></p> <p>INDUST. HYGIENE/SAFETY <i>JW 7-21-83</i></p> <p>MEDICAL REVIEW: 1 August 1983</p>

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RESEARCH
INFORMATION
SERVICES

No. 312

TRICHLOROETHYLENE

Revision D

Date July 1979

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: TRICHLOROETHYLENE

OTHER DESIGNATIONS: TCE, Trichloroethylene, Ethylene Trichloride, Ethenyl Trichloride, $\text{CHCl}=\text{CCl}_2$, GE Material D5B56, CAS# 000 079 016

MANUFACTURER &

TRADE NAMES: BLACO-TRI (Baron-Blakeslee); ALK-TRI, HI-TRI and NEU-TRI (Dow); KAYNIDE (Kraft); PERM-A-CLOR and TRIAD (Detrex); TRICHLOR (PPG); TRICLENED & MD (Diamond Shamrock)

SECTION II. INGREDIENTS AND HAZARDS

Trichloroethylene + Stabilizer*

ca 100

HAZARD DATA

*Stabilizers such as amines or epoxy compounds are usually added at low levels to increase resistance to oxidation and to polymerization. Vapor degreasing grades require higher stabilizer levels.

**ACGIH (1979 Intended Changes List) proposes an 8-hr TWA of 50 ppm with STEL 150 ppm. NIOSH (1978) reviewed TCE as a suspected carcinogen and suggested a TWA of 25 ppm as readily attainable. Unresolved controversy on TCE carcinogenicity at present.

TLV 100 ppm with
200 ppm Ceiling
level**

Human, Oral LDLo
857 mg/kg

Human, Inhal. TCLo
160 ppm/83 min
(central nervous
system)

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg F (C)	---- 188 (87)	Specific gravity 20 C	---- 1.45-1.47*
Vapor pressure @ 20°C, mm Hg	----- 58	Volatiles %	----- ca 100
Vapor density (Air = 1)	----- 4.54	Evaporation rate ($\text{CCl}_4=1$)	- 0.69
Water solubility @ 25°C, %	----- 0.1	Freezing point, deg C	---- -73 to -86*
		Molecular weight	----- 131.39

Appearance & Odor: Colorless, mobile liquid with a characteristic, sweet, ether-like odor whose recognition threshold is 21.4 ppm in air (unfatigued, 100% of test panel).

*Depends on stabilizer and level used.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits @ 57C	LOWER	UPPER
None	770 F (410 C)	in air, Vol % @100C	15	40
			2.5	90%

Extinguishing Media: Use that which is appropriate for surrounding fire. Trichloroethylene is normally considered noncombustible. However, when 15% vapor in air at 33 C is exposed to intense heat (electric arc) or to ordinary flame at vapor-air temperatures exceeding 50 C, it can be made to burn mildly. Combustibility increases in O_2 -enriched air.

Self-contained breathing apparatus should be used for protection against TCE vapors and their toxic and corrosive decomposition products in a fire situation.

SECTION V. REACTIVITY DATA

TCE is considered to be a stable compound under normal conditions of storage and handling. However, when it is heated (as in a vapor degreaser) or exposed to sunlight, it requires stabilization against oxidation, degradation and polymerization. When it is exposed to high temperatures, hydrogen chloride and phosgene (highly toxic) can be produced as decomposition products. It is slowly decomposed by light when moist.

TCE can react with NaOH, KOH, or other strong alkali to form explosive mixtures of chloroacetylenes. Soda ash does not react.

Polymerization of TCE is catalyzed by aluminum chloride. Magnesium or aluminum powder can react with TCE.

SECTION VI. HEALTH HAZARD INFORMATIONTLV 100 ppm or 535 mg/m³ (See Sect II)

Inhalation of TCE above the TLV can irritate nose and throat, with dizziness, drowsiness, headache, nausea, unconsciousness, and even death resulting from excessive exposure. Eye irritation and lacrymation can result from exposure to vapor or liquid. Skin contact causes irritation and, when prolonged or repeated, dermatitis. Ingestion irritates the digestive tract and may cause nausea and rapid drowsiness partial paralysis, unconsciousness and kidney failure can result in severe cases.

FIRST AID:

Eye contact: Wash immediately with plenty of running water. Continue washing to minimize discomfort. Get prompt medical attention.

Skin contact: Remove contaminated clothing. Wash with soap and warm water.

Inhalation: Remove to fresh air; restore breathing if required. Keep at rest and warm. Immediately contact physician; advise him not to give adrenalin.

Ingestion: Get immediate medical help! Do not induce vomiting unless directed by a physician. (Authorities differ; professional decision required). Physician should be warned not to use adrenalin for treatment.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Inform safety personnel and evacuate area for large spills. Clean-up personnel should use respiratory and liquid contact protection. Provide ventilation. Confine spill to as small an area as possible. Do not allow run off to the sewer. Pick up spill with vacuum or on an absorbent and store in closed container for disposal.

DISPOSAL: Waste can be processed to recover TCE, or it can be burned in an appropriately equipped, high temperature incinerator (fume scrubbing system required to remove HCl). Disposal through a licensed waste disposal company should also be considered. Scrap solvent and distillation residues must be handled as toxic wastes. Follow Federal, State and local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general ventilation and exhaust ventilation to keep workplace vapor levels within TLV requirements

Approved respiratory equipment should be available for emergency and nonroutine use. Use self-contained breathing equipment above 1000 ppm; use full facepiece cartridge or canister respirators for limited exposures above ceiling limit or TLV. (Cartridge, 1-2 hrs max.)

Use neoprene gloves, aprons etc. to prevent liquid contact with the skin and splash-proof goggles for eye protection. Gas-tight goggles should be used by maintenance and emergency personnel.

An eyewash station should be available where splashing is probable.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Avoid breathing vapors. Avoid skin contact. Store in a cool, well-ventilated area and use with adequate ventilation, including floor level ventilation. Avoid contact of vapors with high temperature (toxic and corrosive decomposition products from TCE above 700 C). No smoking in use or storage areas.

Avoid collecting aluminum fines or chips in vapor degreaser. Regularly monitor TCE stabilizer level. Only trained personnel should operate vapor degreaser.

TCE has produced liver cancer in test animals. Exercise due caution in use. Evidence of cancer hazard with TCE is greater than with perchloroethylene or 1,1,1-trichloroethane. (OSHA Reporter 1978, 1565). However, observed effects may be due to stabilizers used (not TCE itself).

DATA SOURCE(S) CODE: 1-9, 12, 14, 21

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APPROVALS: MIS, CRD

Industrial Hygiene and Safety

MEDICAL REVIEW: 12/79

MATERIAL SAFETY DATA SHEET

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SCHENECTADY, N. Y. 12305

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DIAL COMM 8*235-4085

IS
MATERIALS SERVICES
INFORMATION

No. 316

BENZENE

Revision C

Date November 1978

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: BENZENE

OTHER DESIGNATIONS: Benzol, Phenylhydride, Phene, C₆H₆, GE Material D5B53, ASTM D835, D836, D2359, CAS #000 071 432

MANUFACTURER: Available from many sources.

SECTION II. INGREDIENTS AND HAZARDS.

Benzene

ca 100

HAZARD DATA

*Current OSHA and ACGIH (1978) permissible exposure level.

Note that the OSHA standard on benzene which would reduce the TLV to 1 ppm with a 5 ppm ceiling, forbid contact with liquid with over 0.5% benzene, and legally classify benzene as a human carcinogen has been struck down by U.S. Court of Appeals.

ACGIH (1978) lists benzene as a suspected carcinogen for humans.

8-hr TWA 10 ppm (skin)
with
25 ppm ceiling level
and
50 ppm 10 minute peak

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg F (C) -- 176 (80)

Specific gravity, 20/4 C -- 0.879

Vapor pressure at 20 C, mm Hg --- 74.6

Volatiles, % ----- ca 100

Vapor density (Air=1) ----- 2.77

Evaporation rate (CCl₄=1) - 1.0

Solubility in water, wt. % ----- 0.06

Molecular weight ----- 78.12

Melting point, deg F (C) -- 42 (5.5)

Appearance & Odor: Clear, colorless liquid having a characteristic aromatic odor. The odor recognition threshold (100% of panel) is 4.68 ppm (unfatigued) in air. Odor is is not an adequate warning of hazard.

SECTION IV. FIRE AND EXPLOSION DATA

LOWER UPPER

Flash Point and Method

Autoignition Temp.

Flammability Limits In Air

120°F (-11°C) (TCC)

1044°F (562°C)

Volume %

1.3

7.1

Extinguishing Media: Water fog, CO₂, dry chemical or foam. Use a blanketing effect to smother fire. A water stream will scatter the fire. A water spray can be used to cool fire exposed containers.

Firefighters should wear approved self-contained breathing apparatus.

This material can form explosive and flammable mixtures with air at room temperature. It is a severe explosion hazard and toxic hazard in a fire situation. Vapors can flow along surfaces to distant ignition sources and flash back.

SECTION V. REACTIVITY DATA

Benzene is a stable compound under normal storage and use conditions; it does not polymerize.

Benzene will react vigorously with strong oxidizers such as ozone, permanganate, sulfuric or nitric acids, potassium peroxide, sodium peroxide, et al. It is a flammable liquid.

OSHA Class IB. Heating greatly increases the fire and explosion hazards.

Oxidation in air will produce oxides of carbon and nitrogen.

SECTION VI. HEALTH HAZARD INFORMATION

TLV 10 ppm or 30 mg/m³ (skin)

Excessive inhalation or prolonged skin exposure may cause headache, weariness, loss of appetite and lassitude with incipient blood effects including decreased cell counts, mild lymphosis and eosinopenia. The most significant toxic effect of benzene is insidious and often irreversible injury to the blood forming tissue from chronic low level exposures. Development of leukemia may occur from chronic excessive exposure! Eye contact yields irritation from liquid or high vapor concentrations. Skin contact will also yield a defatting effect. Inhalation may result in collapse, bronchitis and pneumonia.

FIRST AID:

Eye contact: Wash eyes well with water for 15 minutes. Contact physician.

Skin contact: Wash skin well with water. Contaminated clothing should be removed at once.

Inhalation: Remove victim to fresh air. Restore breathing if required and administer oxygen for labored breathing. Contact physician.

Ingestion: Give edible fats or oils to swallow. Do not induce vomiting (aspiration hazard). Contact a physician immediately.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

If a significant spill occurs, notify safety personnel and evacuate the area. Remove all ignition sources. Provide maximum, explosion-proof ventilation. Clean-up personnel must use approved self-contained breathing apparatus and other protective equipment to avoid contact with benzene.

Remove free liquid. Pick up residue with an inert absorbant, such as vermiculite, and placed in a closed metal container for disposal, using non-sparking tools. When necessary, benzene may be flushed away from a critical area with water, but flush to open area only, not to sewer or to surface waters.

DISPOSAL: Incinerate waste benzene or dispose of via a licensed solvent disposal company. Do not send (or allow run off) to the sewer!

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general ventilation and local exhaust ventilation where benzene is used, handled, or stored to meet TLV requirements. Self-contained breathing apparatus should be available for emergencies and non-routine situations. Approved cartridge or canister type respirators can be used for benzene concentrations up to 50 ppm for short periods. A full facepiece is required above 10 ppm

To prevent skin contact, gloves, aprons, boots, etc of neoprene or other benzene-resistant materials should be used. Chemical goggles or face shields should be used if splashing is possible. Eyewash station should be available where splashing is probable.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Whenever possible, less toxic solvents should be substituted for benzene. Consult health and safety services before benzene is used in plant operations. Do not breathe vapors. Prevent contact with liquid. It is a suspected cancer causing agent!

Keep away from heat, sources of ignition, and oxidizing agents. No smoking in areas of use. Store and handle as OSHA Class IB liquid.

Pre-placement detailed medical examination is needed. Workers who show heart, lung, kidney, liver, nervous disease, or any blood abnormality should not be assigned. Periodic physical examinations and area monitoring is required.

DATA SOURCE(S) CODE: 2-9, 12, 21

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APPROVALS: MIS, CRD

Industrial Hygiene
and SafetyCorporate Medical
Staff

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MATERIALS SERVICES
INFORMATION

No. 317

TOLUENE

Revision C

Date August 1979

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: TOLUENE

OTHER DESIGNATIONS: Toluol, Methylbenzene, Phenylmethane, $\text{CH}_3\text{C}_6\text{H}_5$, GE Material D5B11, ASTM D362 and D841, CAS# 000 108 883

MANUFACTURER: Available from many suppliers, including Shell Chemical Co. and Sun Oil Co.

SECTION II. INGREDIENTS AND HAZARDS

Toluene

%

HAZARD DATA

ca 100

8-hr TWA 100 ppm (skin) or 375 mg/m^3

Human, inhalation
TCLo 200 ppm
(central nervous system)

Rat, inhalation
LCLo 4000 ppm/4 hr

Rat, oral
LD₅₀ 5000 mg/kg

*ACGIH (1978); (skin) notation indicates a potential contribution to overall exposure via skin absorption. OSHA/NIOSH (1976) proposed an 8-hr TWA of 100 ppm, with a 15 minute ceiling of 200 ppm, and an action level of 50 ppm. Current OSHA TLV is 200 ppm.

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg F (C)	--- 231 (110.6)	Specific gravity (Water=1)	-- 0.866
Vapor pressure @ 25 C, mm Hg	----- 28	Volatiles, %	----- 100
Vapor density (Air=1)	----- 3.2	Evaporation rate (BuAc=1)	-- 1.9
Solubility in water, %	----- 0.05	Molecular weight	----- 92.15

Appearance & Odor: Water white liquid with a characteristic aromatic odor, whose recognition threshold (unfatigued) is 2-5 ppm (100% of test panel). Odor detection is unsatisfactory for safety because of fatigue.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
40 F (4.4 C) Closed cup	(536 C) 997 F	% by volume	1.2	7

Extinguishing Media: Carbon dioxide, dry chemical, foam, and water fog. Water may be ineffective for putting out fire, but use spray to cool fire-exposed containers.

At room temperature, toluene emits vapors that can form flammable mixtures with air. It is a dangerous fire hazard and a moderate explosion hazard when exposed to heat and flame. Vapors can flow along surfaces to distant ignition sources, then flash back. Firefighters should wear self-contained breathing apparatus and eye protection when fighting toluene fires.

SECTION V. REACTIVITY DATA

Toluene is a stable material under normal storage and handling. It does not undergo hazardous polymerization.

Since toluene is a flammable liquid, avoid contact with heat, sparks or open flames.

Avoid contact with strong oxidizing agents. Nitric acid and toluene, especially in combination with sulfuric acid, will produce nitrated compounds which are dangerously explosive.

Oxidation in air can form oxides of carbon and nitrogen.

SECTION VI. HEALTH HAZARD INFORMATION

TLV 100 ppm (skin) (See Sect. II)

Vapor inhalation can produce headache and slight drowsiness at 100 ppm, fatigue, nausea and itching skin at 100-200 ppm, anesthetic effects and respiratory tract and eye irritation above 200 ppm. Absorption can occur through the skin, and liquid contact will cause defatting of the skin, with possible dermatitis from repeated or prolonged contact. Eye contact is irritating and can be damaging (corneal burns). Ingestion irritates the digestive tract and results in systemic effects from absorption.

FIRST AID:

Eye Contact: Immediately irrigate with water for 15 minutes. Get medical help.

Skin Contact: Wash area with soap & water; remove contaminated clothing promptly.

Get medical help if irritation persists or if large areas of skin were exposed.

Inhalation: Remove to fresh air; restore breathing and give oxygen if needed. Get medical help!

Ingestion: Get medical help as soon as possible! When victim is conscious, give USP mineral oil to drink. (Aspiration is a potential hazard if vomiting occurs!)

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Report large spills to safety personnel. Remove ignition sources; provide explosion-proof ventilation. Those involved in clean-up must use protection against liquid contact and vapor inhalation. Pick up liquid when feasible, or absorb on vermiculite or sand and scoop up with nonsparking tools into a metal container with cover. Liquid can be flushed with a water spray to an open holding area for handling. Do not flush to sewer, to a confined space, or to a watercourse!

DISPOSAL: Consider reclaiming by distillation or disposal via a licensed waste disposal company. Scrap may be incinerated under properly controlled conditions. Follow Federal, State and local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general and exhaust ventilation to meet TLV requirements. Ventilation fans & other electrical service must be nonsparking and explosion proof. Exhaust hoods should have >100 fpm face velocity and be designed to capture heavy vapors. Exposure above the TLV for nonroutine and emergency situations requires use of an organic chemical cartridge respirator up to 200 ppm; above 200 ppm a full face piece is required with an approved canister-type gas mask or self-contained breathing equipment. Safety goggles or glasses should be worn in areas of use. Impermeable (neoprene has been recommended) gloves and apron, face shield, and other protective clothing may be needed to prevent skin contact during use, especially where splashing may occur. An eyewash station should be available if splashing is possible. A safety shower and washing facilities should be available.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in cool, clean, well-ventilated area away from sources of heat and ignition and away from oxidizing agents. Area must meet requirements of OSHA Class IB liquid. No smoking in areas of storage or use. Nonsparking tools should be used near toluene. Use safety cans for handling small amounts. Ground and bond metal containers for liquid transfers to prevent static sparks. Protect containers from physical damage. Preplacement and periodic medical exams emphasizing the liver, kidneys, nervous system, lungs, heart and blood should be provided. At least an annual exam is recommended for workers exposed above the action level (50 ppm). Use of alcohol can aggravate the narcotic effect and blood effects of toluene.

DATA SOURCE(S) CODE: 1-9,12,20,21,24,26

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

APPROVALS: MIS, CRD

Industrial Hygiene
and Safety

MEDICAL REVIEW: 12/79

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT

SCHENECTADY, N. Y. 12305

Phone: (518) 385-4085

DIAL COMM 8*235-4085

MATERIALS SERVICES
INFORMATION

ND. 355

PHENOL

(REVISION A)

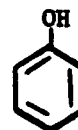
Date September 1980

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: PHENOL

OTHER DESIGNATIONS: Carboic acid, Hydroxybenzene, Phenic acid, ASTM D2439,
GE Material D5J6, CAS #000 108 952, C₆H₅OH

MANUFACTURER: Available from many suppliers.



SECTION II. INGREDIENTS AND HAZARDS

Phenol

*Current OSHA and ACGIH (1980) TLV.

Action Level: One half of permissible exposure or 8-hr TWA. (Skin) notation indicates a potential contribution to overall exposure via absorption through the skin.

NIOSH recommends a 10-hr TWA of 20 mg/m³ with a ceiling of 60 mg/m³ (15 minute sampling period).

A bioassay of phenol for possible carcinogenicity was conducted by NCI who submitted tainted drinking water containing 2,500 or 5,000 ppm phenol to F344 rats and B6C3F₁ mice for 103 wks. Bioassay indicated phenol was not carcinogenic. FR Vol. 45 9/19/80 62563

ca 100

HAZARD DATA

8-hr TWA 5 ppm (Skin)*

or
19 mg/m³

Human, oral

LDLo 140 mg/kg

Mouse, Skin

TDLo 4 g/kg/20W

(Intermittent)

Carcinogenic Effects

SECTION III. PHYSICAL DATA

*Boiling point at 1 atm, deg C	182	Specific gravity (H ₂ O=1)	1.07
Vapor pressure at 25 C, mm Hg	0.35	Melting point, deg C	>40.5
Vapor density (Air=1)	3.24	Molecular weight	94.11
Water solubility, hot water	Miscible	Viscosity, cps, at 80 C	1.51
At room temp., g/100 g H ₂ O	ca 6		

Appearance & Odor: Colorless or reddish (with impurity) crystalline solid; characteristic sharp medicinal sweet tarry odor, which is detectable above 0.05 ppm.

*Water solutions start to boil at lower temp; e.g. 85%: 104 C; 92%: 112 C.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
175 F (79 C) CC	1319 F (715 C)	% by volume	1.5	8.6

Extinguishing Media: CO₂, dry chemical, alcohol foam or water spray.

Do not expose any skin surfaces to phenol, liquid or vapor.

Explosion and fire hazard when phenol is heated; can react vigorously with oxidizing agents. Solid phenol burns, with difficulty, giving off a heavy smoke.

Water solutions involve no fire or explosion hazard when sufficiently diluted.

Firefighters to wear full protective clothing, self-contained breathing apparatus with facepiece operated in positive pressure mode.

SECTION V. REACTIVITY DATA

Phenol is stable under normal storage and use conditions. Hazardous polymerization will not occur.

Contact with strong oxidizing agents may generate explosive mixtures. Calcium hypochlorite produces an exothermic reaction producing toxic fumes which may ignite.

Oxidation products include oxides of carbon and nitrogen when burned in air.

Phenol is acidic. Avoid temp. higher than 50 C. [Higher volatility and oxidation rate]

SECTION VI. HEALTH HAZARD INFORMATIONTLV 5 ppm or 19 mg/m³ (Skin)

A general protoplasmic poison which is corrosive to cells. Poisoning can occur by skin absorption, vapor inhalation or ingestion. Phenol vapors readily penetrate the skin surfaces with an absorption efficiency equal to that for inhalation. A skin anesthetic, initial contact produces a white wrinkled discoloration yielding serious burns or systemic poisoning if not removed promptly.

Symptoms can develop rapidly. When ingested, burning pain from mouth to stomach; blotches, first white than brown, on lips and in mouth. Headache, nausea, dizziness, dyspnea, shock, convulsions, and death may follow excessive exposures by any route.

FIRST AID: Call physician immediately - provide help without delay! Combat shock.

Eye Contact: Promptly wash with running water for 15 minutes.

Skin Contact: Promptly wash area with soap and water, then with alcohol or olive oil.

Inhalation: Remove to fresh air. Initiate artificial respiration/oxygen if needed.

Ingestion: Give water, milk or olive oil. Physician to start gastric lavage immediately! (NIOSH recommends giving large quantities of water to conscious person and inducing vomiting.)

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel; remove ignition sources, provide adequate ventilation, and prevent skin contact (see Sect. VIII).

Absorb liquid spills on paper, vermiculite, or other absorbent and place in a closed metal container.

DISPOSAL: Burn contaminated waste in an approved incinerator. Phenol may be recovered by charcoal absorption, solvent extraction or steam stripping. A concentration of 1% by weight is required for economical recovery. Phenol is water soluble and is amenable to biological or chemical oxidation. Solutions can be chemically oxidized by chlorine, chlorine dioxide, or other oxidants. Phenol content of water supply not to exceed 0.001 mg/L. (DO NOT flush phenol down drains.)

SECTION VIII. SPECIAL PROTECTION INFORMATION

When phenol is heated, vapor inhalation can be a serious hazard without proper precautions. Provide efficient exhaust ventilation to meet TLV requirements. Exhaust hoods should maintain 100 fpm minimum face velocity.

Workers handling phenol should use neoprene or polyethylene gloves, aprons and boots to prevent skin contact and use safety glasses in normal use or face shields where splashing may occur. Use additional protective clothing as required.

Contaminated clothing to be laundered before reuse.

Eyewash stations and chemical safety showers to be readily accessible. When gross phenol contact occurs remove contaminated clothing under safety shower. Continue washing until all odor of phenol has disappeared. Use alcoholic soap to aid phenol removal from skin.

Employee education and training to include handling, storage, and material hazards.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Prevent skin contact! Do not breathe vapors! Remove contaminated clothing immediately!

Areas of use or handling should not allow smoking or eating.

Store in a cool, dry well-ventilated area, away from heated surfaces, open flames and ignition sources. Separated outdoor storage preferred.

Do not allow employees who have diseases of the central nervous system, liver, kidneys or lungs work in areas of phenol exposure. Preplacement and periodic medical exams should be provided to those working with phenol.

Do not allow untrained workers to handle phenol! (See also ASTM D2286 - Sampling and Handling Phenol).

ICC & DOT - Class B POISON.

DATA SOURCE(S) CODE: 2-12,15,19,23-24,31,34,37,38

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APPROVALS: MIS
CRD

Industrial Hygiene
and Safety

MEDICAL REVIEW:

10-9-80
10/22/80

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT
120 ERIE BOULEVARD
SCHENECTADY, N.Y. 12305



NO. 366

CHLOROBENZENE

Revision A

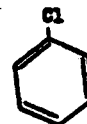
DATE November 1982

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CHLOROBENZENE

OTHER DESIGNATIONS: Chlorobenzol, Monochlorobenzene, Phenyl Chloride, C_6H_5Cl ,
CAS #000 108 907

MANUFACTURER: Available from several suppliers.



SECTION II. INGREDIENTS AND HAZARDS

Chlorobenzene

%
ca 100

HAZARD DATA

8-hr TWA 75ppm or
350 mg/m³*

*Current OSHA PEL and ACGIH (1982) TLV.
Long term bioassay was underway at
NCI in 1980.

Rat, Oral

LD₅₀ 2910 mg/kg

Mouse, Inhalation
LCLo 15 gm/m³

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg C ----- 132
Vapor pressure at 25 C, mm Hg ----- 11.8
Vapor density (Air=1) ----- 3.9
Water solubility, 25C, g/100g H₂O -- 0.049
Log Octanol/water Partition ----- 2.83

Specific gravity (H₂O=1) ----- 1.11
Melting point, deg C ----- ca -45
Evaporation rate (n-BuAc=1) - 1.0
Volatiles, % ----- ca 100
Molecular weight ----- 112.56

Appearance & Odor: A clear, colorless, volatile liquid with a faint, almond-like odor.
Threshold odor conc: 100% recognition, 0.21 ppm. Good warning properties.

SECTION IV. FIRE AND EXPLOSION DATA

			Lower	Upper
Flash Point and Method	Autoignition Temp.	Flammability Limits in Air		
29C (84F) (TCC)	638 C (1180F)	% by Volume	1.3%	7.1% 9.6% @150C

Extinguishing Media: CO₂, dry chemical, or foam. A water spray can be used to control small fires or cool fire-exposed containers. A layer of water can be used to blanket chlorobenzene and may be useful for extinguishing fire in an open tank.

Vapors of this material may flow along surfaces for a considerable distance, reach an ignition source, and flash back. A dangerous fire hazard when exposed to heat or flame. Firefighters should use eye protection and self-contained breathing apparatus in fighting fires in which this material is involved.

SECTION V. REACTIVITY DATA

This is a stable material in closed containers at room temperature under normal storage and handling conditions. It does not polymerize. It is incompatible with oxidizing agents. Chlorobenzene can react violently with dimethyl sulfoxide. Silver perchlorate will form a solvated salt with chlorobenzene which is shock sensitive (explosion). Thermal-oxidative degradation products can include soot, hydrogen chloride, phosgene, and carbon monoxide.

SECTION VI. HEALTH HAZARD INFORMATION	TLV 75 ppm (See Sect II)
<p>Chlorobenzene is a fairly strong narcotic and can cause CNS depression. Overexposure is irritating to the eyes, nasal passages, and upper respiratory tract. It is moderately toxic by inhalation or ingestion and can be absorbed slowly through the skin. Short exposures to liquid may cause skin irritation and defatting, while prolonged or repeated skin contact may result in dermatitis or skin burns.</p> <p>Repeated inhalation exposures to animals at 1,000 ppm over a period of 44 days resulted in lung, liver, and kidney changes; at 475 ppm slight liver changes were observed; no abnormal effects noted at 200 ppm. Symptoms to be expected from acute exposure are headache, dizziness, drowsiness, cyanosis, spastic contractions of extremities, and loss of consciousness, depending on conc. and time of exposure.</p> <p>FIRST AID:</p> <p><u>Eye Contact:</u> Flush thoroughly with running water for 15 min. including under eyelids.</p> <p><u>Skin Contact:</u> Remove contaminated clothing. Wash area promptly with soap & water.</p> <p><u>Inhalation:</u> Remove to fresh air. Restore and/or support breathing as required.</p> <p><u>Ingestion:</u> Contact physician and/or transport for gastric lavage.</p> <p>Seek prompt medical help for treatment, observation and support after first aid.</p>	
SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES	
<p>Make prior plans to handle emergencies. Suppliers can be helpful.</p> <p><u>Eliminate ignition sources;</u> notify safety personnel. Provide ventilation (explosion proof). Clean up workers need protection against inhalation of vapors and contact with liquid. Collect spill with absorbent solid, such as paper or sawdust, or as a liquid and place in sealed metal container for disposal. Use non-sparking tools.</p> <p><u>DISPOSAL:</u> Dispose of scrap by burning in an approved incinerator with a scrubber, or dispose of through a licensed waste disposal company. Follow Federal, State and Local regulations.</p> <p>AQUATIC TOXICITY TLM 96: 100-lppm</p> <p>EPA (RCRA) HW No. U037 (40CFR261). EPA (CWA) RO 100 lb (40 CFR 117)</p>	
SECTION VIII. SPECIAL PROTECTION INFORMATION	
<p>Provide adequate general and local exhaust ventilation (explosion-proof equipment!) to meet TLV requirements. Use a chemical cartridge respirator with a full facepiece and an organic vapor cartridge for vapor conc. < 1000 ppm. A self-contained breathing apparatus with full facepiece is suitable to use up to 2400 ppm.</p> <p>Use impervious (VITON is best; neoprene, "fair") gloves, aprons, protective clothing, etc. to avoid skin contact with liquid. Use chemical safety goggles where splashing is possible. Clothing soiled with liquid to be removed promptly and laundered before reuse.</p> <p>Provide an eyewash station and safety shower in area of use and handling.</p> <p>Preplacement and periodic medical examinations should emphasize skin, liver, lung, and kidney disorders. Those with such problems may be at an increased risk from exposure.</p>	
SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS	
<p>Store in tightly closed containers in a well-ventilated, fire-resistant area away from heat, sources of ignition, and oxidizing agents. Outside or detached area preferred.</p> <p>Storage and handling must be suitable for an OSHA Class IC Flammable Liquid. Protect containers from physical damage.</p> <p>Ground and bond containers and equipment for transfers to avoid static sparks. Use non-sparking tools. Electrical services must meet code. Use safety cans for small amounts.</p> <p>Avoid breathing vapors! Avoid contact with liquid. Do not ingest.</p>	
DOT Classification: FLAMMABLE LIQUID I.D. No. UN1134 Label: FLAMMABLE LIQUID	
DATA SOURCE(S) CODE: 2-12, 14, 16, 23, 25-27, 31, 34, 37, 38, 45-47, 49	
<p>Judgments as to the suitability of information herein for purchaser's purposes are necessary purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.</p>	<p>APPROVALS: MIS/CRD <i>J.M. Nelson</i></p> <p>INDUST. HYGIENE/SAFETY <i>DW 11-17-82</i></p> <p>MEDICAL REVIEW: 27 November 1982</p>

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT

SCHENECTADY, N. Y. 12305

Phone: (518) 385-4085

DIAL COMM 8*235-4085

IS
MATERIALS
INFORMATION SERVICES

No. 1200

AROCLOR 1254

Date May 1980

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: AROCLOR 1254

DESCRIPTION: Distillation cut of polychlorinated biphenyl (or diphenyl), containing 54% Cl.
OTHER DESIGNATIONS: PCB, an Askarel, PYRANOL, GE Material A13B1, CAS # 027 323 188
MANUFACTURER: Material was a product of Monsanto Co., but dropped in 1977. Except for uses specifically exempted and regulated by EPA (for example power transformers), legal manufacture, distribution in commerce, and use of PCB's in USA ended in 1979 under TSCA.

SECTION II. INGREDIENTS AND HAZARDS

Mixture of Chlorinated Biphenyls, $C_{12}H_{10-x}Cl_x$:

x	Approx. %
2	0.5
3	1
4	21
5	48
6	23
7	6

Includes 69 or more compounds with average of 4.98 Cl atom/molecule. Mixture may contain 0-2 ppm chlorinated dibenzofurans.

*Current ACGIH 8-hr TWA is 0.5 mg/m³. NIOSH has proposed a 10-hr TWA of 1.0 µg/m³. Materials with over 50 ppm PCB content are regulated for handling, storage, records, and waste disposal. EPA criterion in navigable waters is 0.001 µg/L. PCB's.

x
ca 100

HAZARD DATA

EPA exemption or authorization needed for any measurable exposure*

Rat, Oral LD50
Adult 4-10 g/kg
Weaning 1.2 g/kg

Rat, Intravenous
LD50 358 mg/kg

Rat, Oral, TDLo
1220 mg/kg/35 wk
(neoplastic effect)

SECTION III. PHYSICAL DATA

Boiling range at 1 atm, deg C	---- ca 360-390	Specific gravity (65/15.5 C)	-- 1.5
Vapor pressure at 150 C, mm Hg	--- <1	Pour point, deg C	----- 10
Water solubility at 25 C, ppm	---- ca 0.01	Molecular weight (Av)	----- 327
Viscosity at 100 F, cstk	----- ca 460	Partition Coef. (octanol/water)	>10 ⁴

Appearance & Odor: A light yellow, viscous fluid.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
None to boiling point				

Extinguishing Media: Use media appropriate to the surrounding fire conditions. This material has very low combustibility, but it can undergo thermal-oxidative degradation in a fire situation.

Firefighters should use full protective clothing and self-contained breathing equipment when fighting fire where any PCB's are involved.

SECTION V. REACTIVITY DATA

AROCLOR 1254 and other PCB's are nearly inert materials with very high chemical stability; the higher chlorine levels usually give the greater stability. At about 300 to 600 C some PCB's can oxidize to produce chlorinated dibenzofurans which are much greater in toxicity than the PCB's. For complete incineration of PCB's a 2-second dwell time above 2000 F (1090 C) with 3% excess oxygen in the stack is suitable (see Sect. VII). AROCLOR 1254 shows very little degradation after 3 weeks exposure to direct sunlight. PCB's are strongly absorbed on particulates or sediments in aquatic systems (streams, lakes, ocean, etc.). Mixed in activated sludge, biodegradation occurs slowly, but only very slowly or almost not at all with compounds above Cl₄.

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SECTION VI. HEALTH HAZARD INFORMATION

TLV (See Sect. II)

PCBs show high levels of bioaccumulation in fatty tissue and very slow metabolism, especially for Cl₅ compounds and above. They have become widely dispersed in world-wide environment and in the food chain (much like DDT) since their introduction in 1929. Effective control of PCB discharge into the environment began after 1970.

AROCLOL 1254 has a low vapor pressure, but it can be irritating to the eyes, nose, and throat if misted or heated to produce vapors. Excessive acute and chronic exposures may cause liver damage. Chronic exposure to or ingestion of PCB's (especially when thermally oxidized) can result in chloracne after 1-6 months. There is some evidence of possible carcinogenic risk and adverse reproductive effects with this material. PCB's may appear in the breast milk of an exposed mother.

FIRST AID:

Skin Contact: Clean exposed skin with waterless cleaner, wipe with a disposable towel then wash with soap and water. Promptly remove contaminated clothing. (Control separate disposal of PCB-contaminated materials.)

Eye Contact: Flush promptly & thoroughly with lots of running water for 15 minutes.

Inhalation: Remove to fresh air. Get medical help if symptoms continue.

Ingestion: Get medical help. NIOSH has recommended that vomiting be induced.

Get medical help in all cases of severe exposure, repeated exposures, or persistent symptoms.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel of all PCB spills or leaks. Promptly contain spilled material! Prevent its release into the environment! Restrict PCB spill area to trained clean-up personnel; use proper protective gear; follow an established emergency plan.

Stop leakage if possible. Pick up spill. Absorb small spills and residues using a powdered, dry clay. Place leaking containers, picked-up PCBs, and PCB-contaminated materials and refuse into approved, properly labeled, closed containers for storage under controlled, EPA regulated conditions prior to disposal. EPA allows approved storage to 1/1/84. (See Sect. IX.) Storage: 40CFR761.42; Annual report: 40CFR761.45

DISPOSAL: Destroy PCB-containing material by burning in an EPA approved facility. Liquid 50-500 ppm PCB material can be burned as above or landfilled if not ignitable. Non-flowing, PCB-contaminated debris can be disposed of in an EPA approved landfill. (See 40CFR 761; Federal Register, Vol. 44, 31551-4, 66989; Vol. 45, 20473.)

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide highly effective local exhaust ventilation (trap for exhaust vapors) especially if this material is heated or misted. Unless authorized by EPA an isolated system must be used for PCBs.

For nonroutine and emergency conditions of exposure use an approved canister respirator or self-contained breathing equipment.

Prevent skin contact for those who work with PCBs. Use neoprene or polyethylene gloves and apron, safety glasses and/or face shield, and other protective clothing as determined by use conditions. An eyewash station and washing facilities should be available to the work area.

Provide for special handling and disposal of PCB-contaminated materials, including paper towels and clothing (see Sect. VII). Provide locker and shower facilities. Workers must be trained for PCB work, and they must follow good hygienic practice.

Provide pre-placement medical exams for workers with emphasis on liver function, skin condition, and reproductive history. Provide annual medical exams for exposed workers.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

PCB materials in containers and in equipment must have proper labeling including the date of storage. Short term (up to 30 days) storage of non-leaking PCBs can be done. Long term storage requires an EPA approved facility, including such criteria as roof and walls to shield from rain, impervious base and diking which will contain 25% of stored volume or twice the volume of the largest container, no drains or openings to allow flow loss, and the base must be located above the 100-year flood water elevation.

Prevent physical damage to containers. Inspect storage frequently. Prevent skin contact with PCBs, or with solid products contaminated with PCBs. Prevent inhalation of airborne PCBs. Properly contain PCBs until legally disposed of; do not allow them to escape into the environment! PCBs, and especially used PCBs, can contain higher toxicity contaminants.

DATA SOURCE(S) CODE: 1-6,20,26,31,36

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APPROVALS: MIS
CRD

Industrial Hygiene
and Safety

MEDICAL REVIEW: June 1980